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ABSTRACT

This document describes the requirements for the degree of Master of Military Art and Science (MMAS) at the United States Army Command and General Staff College (CGSC), Fort Leavenworth, Kansas. Chapter one outlines program requirements for the MMAS, discusses the place of research at CGSC, describes research requirements for the MMAS, and discusses the CGSC faculty. Chapter two describes general research methodologies, tells how to prepare a research proposal, and discusses the research process and the writing of the thesis. Appendixes provide an outline for a proposed thesis problem statement, a sample title page for a thesis, a sample thesis approval page, special instructions for preparing defense documentation center documents, a list of proofreader's marks, and typing guidelines. The document includes a bibliography of publications on statistical and research processes. (GW)

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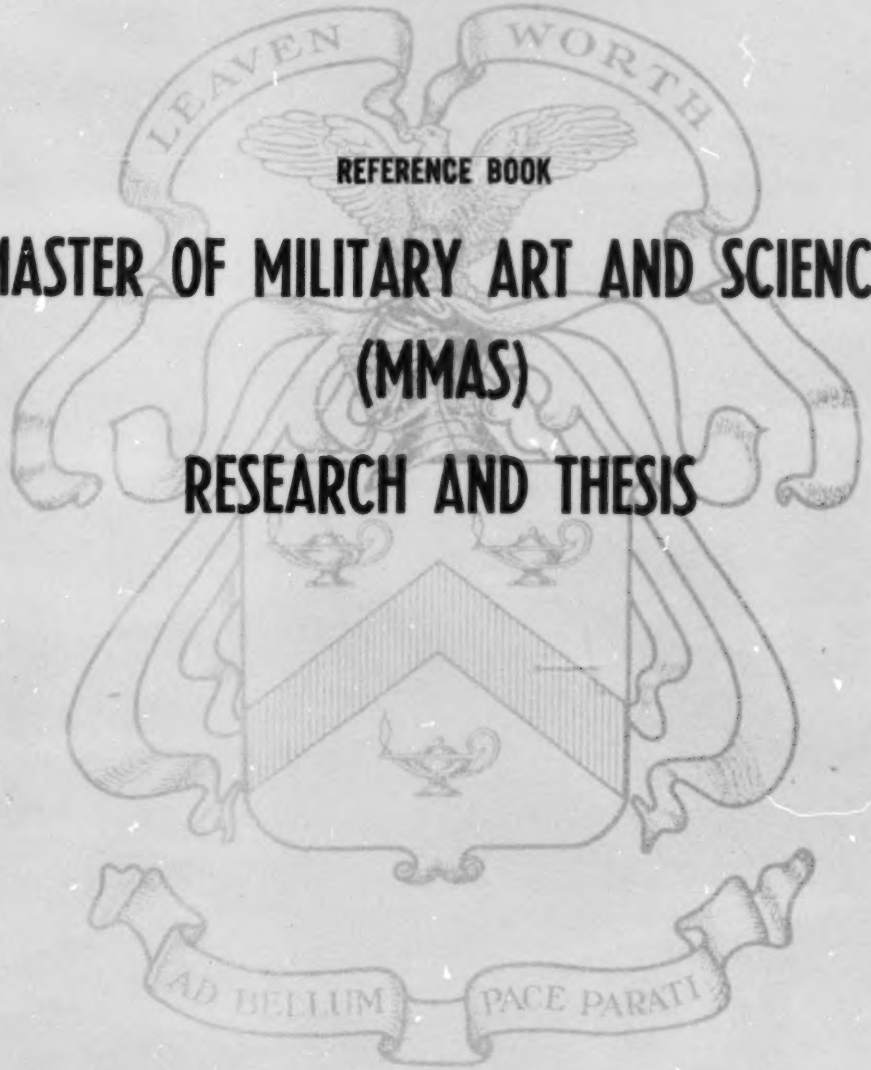
RB 908-1

REFERENCE BOOK

# MASTER OF MILITARY ART AND SCIENCE (MMAS)

# RESEARCH AND THESIS




U.S. ARMY COMMAND AND GENERAL STAFF COLLEGE
Fort Leavenworth, Kansas
1 June 1976

CS 203 549

7L6-2210

## MMAS

## AY 76–77 Schedule

| | |
|---|---|
| 13 Sep 76 | Latest date for submission of the thesis proposal. |
| 25 Sep 76 | Notification of selection of the research advisor and committee members. Hereafter, thesis committee meetings called as required to evaluate student progress. |
| Oct 76 | Consulting Faculty visit and review after 11 October. |
| 11 Oct 76 | *Submit draft of chapter 1, proposed thesis outline, and bibliography. (50 percent of term 1 grade for course 0995.) |
| Dec 76 | Consulting Faculty visit and review. |
| 1 Dec 76 | *Submit the revised thesis outline, updated draft of chapters 1, 2, draft chapter 3, and bibliography. (50 percent of term 1 grade for course 0995.) |
| 6 Feb 77 | *Submit updated draft of the proposed outline, chapters 1, 2, and 3 and the bibliography. (The grade for this submission constitutes the grade for Course 0996, Research and Thesis.) |
| Apr 77 | Consulting Faculty final visit and review. |
| 15 Apr 77 | *Submit thesis in three copies to committee members. |
| 25 Apr–6 May 77 | Candidates should coordinate with the research advisor and the MMAS office to reserve a time for the academic oral comprehensive exam. |
| 16 May 77 | *Submit final thesis with abstract as approved by the research committee. (The final thesis grade constitutes the grade for Course 0997, Research and Thesis.) |
| 16 May–27 May 77 | Complete the academic oral comprehensive examination. |
| 10 Jun 77 | Graduation. |

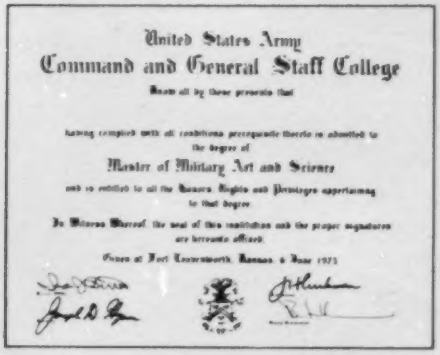
*If a Consulting Faculty member is assigned to the committee, the candidate should submit two copies to the research advisor with one copy ready for mailing to the Consulting Faculty member. The candidate must obtain franked envelopes for this purpose from the MMAS office to accompany his submission to the research advisor.

## PREFACE

Knowledge is doubling every 30 years in a world that is shrinking in time-size. The military, along with society at large, is affected by the resulting changes in technology, economics, and sociology. As in the past, the graduate of the U. S. Army Command and General Staff College must be prepared to cope with changes while preparing himself to fight the next war, and hopefully, to prevent it. This requires attitudes and perspectives conducive to desirable or necessary change.

As never before, the military decisionmaker must have a grasp of research methods and techniques and skills in analysis of data upon which new concepts in military art and science may be developed.

A distinguishing characteristic of a recognized profession is its related scholastic discipline. Military art and science is the scholastic discipline of the military profession. It is the study of the development, operation, and support of military forces in peace and war and of the interrelationships of the economic, geographic, political, and psychosocial elements of national power with the application of military force in order to achieve national objectives.



United States Army
Command and General Staff College

Master of Military Art and Science

THE DEGREE
MASTER OF MILITARY ART AND SCIENCE

# MASTER OF MILITARY ART AND SCIENCE (MMAS) RESEARCH AND THESIS

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# CHAPTER 1

# THE MMAS PROGRAM

## Section 1. PROGRAM REQUIREMENTS

The MMAS Degree Program requires that a student:

1. Make application and be selected as an MMAS degree candidate.

2. Achieve an average of B or better in the CGSC common curriculum.

3. Achieve a grade of B or better in Course 0995, Research Methodology, and Courses 0996 and 0997, Research and Thesis.

4. Maintain a B standing throughout the academic year.

5. Meet the MMAS submission schedule at page i.

6. Complete a successful final thesis product and pass the academic oral comprehensive exam prior to the CGSC graduation date.

### Regular CGSC Course

The Regular Course at CGSC is graduate level and constitutes the formal course work of the Master's Degree Program. Participants in the program will pursue the Regular Course in the same manner as nonparticipants except they will enroll in courses 0995, 0996, and 0997. Course 0995 is primarily devoted to classroom instruction and seminar discussions, while courses 0996 and 0997 are both devoted to independent research time.

### Thesis Proposal

Every proposed student thesis project is subject to approval. Approval is based on the validity of the proposal, its relevance and importance to military art and science, originality, and the availability of necessary resources, facilities, and time. The research proposal is to be submitted in four copies by the student to Director, MMAS using the form suggested for the proposed thesis problem statement at appendix A.

### The Thesis

The thesis must show independent thinking, original investigation, mastery of subject matter, and ability to do research in the field of military

art and science. Its final acceptability will be determined by the quality of--

. The research and its significance to military art and science;

. The presentation of this research in writing.

The thesis must be consistent throughout in style and form.

Form and Style in Thesis Writing, by W.G. Campbell (1969 or 1974) provides one format for the writing of theses. It will be issued to each candidate and should be returned to the Director, MMAS, when the thesis is completed. Familiarity with the prescribed points of form during the initial stages of thesis preparation will greatly facilitate the proper development and writing of the final draft.

Chapter end notes may be used in lieu of footnotes. The Publication Manual of the Americal Psychological Association, Second Edition, 1974, is recommended as a guide for use of end notes and reference citations in the text.

Campbell's and the APA manual are also available for purchase in the bookstore.

## Typing

The candidate should, at the earliest opportunity, make arrangements for the typing of his thesis. The cost of having this done by a professional stenographer will usually exceed $100.00. The Office of the Secretary, Room 126, Bell Hall, will supply a list of typists' names on request.

Pen and ink changes on all submissions except the final thesis are acceptable, but material submitted in draft form should be typed and words spelled correctly.

Three copies of the complete thesis will be prepared and submitted to the research advisor not later than 15 April 1977 in accordance with the schedule included at page i.

One original copy of the thesis and two copies of the thesis abstract, incorporating the changes directed as a result of the review of the thesis by the research committee, typed on 20-pound, 25 percent rag, white bond paper, will be submitted to the research advisor not later than 16 May 1977. The thesis will be submitted, unbound, in a plain folder with the candidates name on the front of the folder. Folders will be provided by the MMAS office.

Oral Comprehensive Examination

The primary purpose of the oral comprehensive examination is to review the thesis effort and appraise the candidate's knowledge of the College curriculum.

The comprehensive examinations will be conducted during the period 16–27 May 1977. The draft schedule for comprehensive examination will be posted in room 123 during the period 25 April to 6 May 1977.

Following is the procedure for conduct of the comprehensive oral examination:

1. The MMAS candidate must submit 6 copies of the thesis abstract to the research advisor at least 72 hours prior to the exam. The research advisor will forward one copy to each comprehensive examination committee member and the Director, MMAS.

2. At the beginning of the examination approximately 30 minutes will be devoted to an informal discussion of the candidate's research effort. Thereafter, each department representative will present application-type questions relating to the College curriculum and the candidate's research. Each department representative will be allocated approximately 20 minutes for questioning the candidate.

3. After the examination, the candidate will be excused to await the decision of the board. Immediately after their discussion the research advisor will inform him of the decision concerning his performance--pass or failure to pass.

4. Failure to successfully complete the comprehensive examination will be reported immediately to Director, MMAS by the examination committee chairman. The Director, MMAS will refer the matter to the CGSC Faculty Board for final determination.

## Section II. THE PLACE OF RESEARCH AT CGSC

Research contributes to increased individual intellectual awareness, facilitates the acquisition of new skills and knowledge, and feeds the intangible, but nonetheless vital, quality of intellectual curiosity. In this context, research is preeminently an educational problemsolving process and experience.

The several stages of complete research include problem identification; forming hypotheses or research questions; gathering relevant information; analyzing known facts and ideas; discovering previously unknown facts, theories, insights, or applications; interpreting and testing them to arrive at conclusions concerning their validity; and publishing and disseminating the results. This is complete research. Its hallmarks are the development or

discovery of something new, something previously unknown, or something unperceived and the dissemination of the results so as to increase the store of information and to obtain peer evaluation.

## Section III. MMAS RESEARCH

MMAS research contributes directly to accomplishment of missions and objectives of the College Master's Program. The products of this research program constitute valuable contributions to the literature of military art and science, and serve further to foster excellence in military scholarship. Dissemination of the results of the MMAS research to all interested agencies assists in the achievement and maintenance of a position of intellectual leadership for the College within the military community and position of full membership in the broader civilian academic community.

The primary purposes of MMAS research are to increase the professional knowledge of the individual student by in-depth study of some specific topic of professional interest within the discipline of military art and science and contribute to the literature of his profession. In conducting and reporting his research, the student officer learns to design a research study, formulate hypotheses or questions, collect relevant data, analyze such data, and present, in usable form, conclusions derived from them.

### Standards

Thesis research at CGSC characteristically should show independent thought, original investigation, and mastery of the subject matter. Minimally, it should be a comprehensive treatment of a limited subject or problem and should contain logical conclusions and/or recommendations. The thesis will be judged on the qualities of completeness, conciseness and correctness, clarity of expression, and originality.

### Conditions and Limitations

The subject area of the MMAS candidate's thesis must be approved by the Director, MMAS. The candidate should conduct a search of available literature early in the school year and be prepared to alter or change his subject, if necessary. After assignment of a research advisor requests for subject changes should be forwarded through the research advisor to the Director, MMAS.

### Resources

The principal resource for research is the library and its services. A significant amount of research documentation related to Military Art and

Science is in the files of CACDA action officers and CGSC staff and faculty personnel. The candidate is advised to search out all available sources. In developing a research proposal a student should consider carefully its feasibility in terms of the physical facilities required and the time and space factors involved. See circular 1 regarding necessary clearances for research efforts or correspondence outside the College.

Data Processing

Candidates who desire to use data processing facilities should report to the Information Systems Office (ISO), Operations Branch, classroom 24, and complete the necessary request form.

Questionnaires

All requests to use questionnaires within CGSC must be cleared by DF through the research advisor, MMAS Director, and Class Director (see circular 1). Requests to use questionnaires outside CGSC must be cleared by DF through the research advisor, MMAS Director, Class Director, and Assistant Commandant. The questionnaire must be an inclosure to the DF.

Security Requirements

Students may pursue any research project regardless of its security classification. The following factors are pertinent to research being done with classified subject material:

1. The investigator must be cleared for access to the sources of information in accordance with current regulations.

2. The handling of classified material imposes certain time and physical restrictions. Research must be conducted in secure areas, such as the third floor library and classrooms within the College. The librarian, room 208A in the library, will assign an accessible classified container to MMAS candidates upon request. Documents and derived information must be handled, recorded, and stored in accordance with security regulations. Working papers and documents may be stored for limited periods of time in the secure area (third floor) of the library. Operating hours of the secure area impose a considerable constraint on the student's available time to work on his classified research material. Classified material may be signed out and stored in individually assigned classified containers for use after duty hours.

3. Cost of typing a classified thesis is generally greater than an unclassified thesis.

The above factors should be considered in the development of a proposal. The merit of the subject is the primary determinant of the acceptance or rejection of a proposal. Classification of student research reports should be as low as possible, consistent with the limitations imposed by resource materials, to enable wide dissemination.

## Section IV. THE FACULTY

The U. S. Army Command and General Staff College is a graduate-level, professional educational institution. Members of the faculty are selected and assigned on the basis of their professional qualifications, experience, and special competencies in the field of military art and science.

### Research Advisor

The entire staff and faculty of the Command and General Staff College are available to advise and assist students who are engaged in MMAS research. However, for each MMAS candidate one member of the staff, faculty, CACDA, or post complement is designated as his research advisor, and as the chairman of his thesis committee. The research advisor coordinates the efforts of the committee in guiding and evaluating the research efforts of the candidate and is the chairman of the candidate's comprehensive examination committee.

### The Thesis Committee

The Director, MMAS will notify the candidate of the selection of the thesis committee after the problem statements have been submitted in accordance with the schedule on page i. The committee normally will consist of three members: the research advisor; a committee member selected from the resident faculty, CACDA, or the post complement; and a member of the Consulting Faculty. The thesis committee members are selected to complement the qualifications of the research advisor because of their acquired expertise within a field of specialization and/or research experience.

A student should feel free to call upon any member of his thesis committee for assistance at any time. He is responsible to keep all members of his thesis committee informed of his thesis status. All members of a student's thesis committee are available to him for help in pursuing his research effort.

### The Consulting Faculty

This group of reserve officers, selected from the faculties of colleges and universities or other related professions, serves the staff, faculty, and students of the CGSC in a variety of ways—as consultants on academic matters, as classroom instructors, as seminar leaders or participants, as research consultant members of thesis committees for MMAS degree candidates. As MMAS research consultants they interact with students directly during their periods of active duty (generally comprising three visits of a few days each), and at other times by mail or telephone. Student contacts by mail or telephone with members of the Consulting Faculty should be cleared through the assigned research advisor to keep him informed.

The Consulting Faculty member will normally be in residence for three short tours of duty in accordance with the schedule on page i. He will be here early in the academic year in October to advise the student concerning his research methodology and to plan for conduct of his research. The second and third visits in December and April will be concerned with the progress and plans for the final draft report. It is the responsibility of the student to keep the Consulting Faculty member of his committee informed of his progress. To fail to do so invites problems in the final stages of review of the research effort. All correspondence with the Consulting Faculty should be forwarded by the research advisor and returned to the research advisor. The Director, MMAS, will maintain a supply of franked envelopes to forward to the Consulting Faculty when a reply is expected. Correspondence requests for assistance from the Consulting Faculty member should be stated completely so that he is fully aware of what is expected. If for some reason he cannot comply with the request, he will respond by return mail. Correspondents should include a business-size franked envelope for his response.

## Student-Faculty Relationships

An appreciation of the importance of research in the development of our military leaders is a necessity in military art and science. At USACGSC, research advisors and students are encouraged to value the exchange of ideas in an environment of free inquiry. Scholarly interactions between students and members of the faculty in the College can be only mutually supportive and beneficial.

## Student Responsibility

Research experience is both unique and personal--unique in that each identified research problem has conditions and limitations peculiar to it alone and personal in that, although for each research problem there may be numerous possible approaches or methods of study, only the researcher is able to make a commitment to any of the many and often complex judgments involved. Implementation of research is the sole responsibility of the investigator. His investigative responsibilities include preparing a detailed statement of the problem, selecting methods of analysis, gathering the data, synthesizing the information, and producing a final report.

## Faculty Responsibility

While the responsibility of ultimate decisions concerning the methods and content of a particular research project is that of the student, the responsibility for assisting him to make decisions in an informed and reasoned

way lies with the members of his committee. This includes regular and frequent consultation with the student to promote an understanding of the methods and techniques of research, the establishment of acceptable standards, and the identification of errors, weaknesses, or omissions in the research process. Contributions of the advisor, committee members, and other CGSC staff and faculty members are most useful to the student in the early phases of research. During all phases of the work the research advisor plays an indispensable role by providing an external perspective and an informed and critical objectivity.

# CHAPTER 2

## RESEARCH METHODS AND PROCEDURES

"Research is one of the highly complex and subtle activities that usually remains quite unformulated in the minds of those who practice them." W.I.B. Beveridge

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### Section I. INTRODUCTION

Increasingly, elaborate apparatus and technique play an important part in modern research, so much so that we are inclined to forget that the most important instrument in investigation must always be the mind of man. Much time and effort are devoted to training and equipping the mind of man, but little attention is paid to the technicalities of making the best use of knowledge available or the practice and mental skills--the art--of research. The complexities and subtleties of research make some think that formal instruction in how-to-do-it is impossible. Admittedly, training in research is largely self-training, preferably with the guidance of an experienced advisor. Nevertheless, lessons and general principles can be learned from the experience of others. Course 0995, Research Methodology, is designed to familarize the student with graduate level research. A brief presentation of some methods of research and suggestions concerning research writing are included here as preliminary guidance for students. This manual should not, however, be regarded as a textbook on research. While this chapter does touch upon several research methods, techniques, and procedures, its primary purpose is to stimulate thought in some key areas of the research process and to suggest subjects for wider reading and study. The bibliography in appendix G has been prepared to assist in achievement of this purpose. The College Library also has valuable books which are not listed in the bibliography.

### Section II. WHAT IS RESEARCH?

Research, simply stated, is the systematic search for new knowledge. It appeals especially to people who are individualists. Consequently, research methods vary from one person to another. Procedures followed by one person may be unsuitable for another, and different methods are required in different disciplines.

## Section III. METHODS OF RESEARCH

A method is a general way of doing, planning, or organizing. Three research methods--the descriptive, historical, and experimental--are the most commonly described in research texts, although mathematical modeling, computer simulation, and professional problem studies are frequently of greater value to the field of military art and science. In research, any general method may employ a number of different techniques and procedures. Also, depending upon the nature of the research problem, more than one method may be used in a study. The student's work should not be limited by the traditional concepts of research; innovation and creativity are encouraged in the production of MMAS theses. The College is especially interested in theses using methods described as design oriented.

### The Descriptive Method

The descriptive method is a research plan that undertakes to describe relationships existing at a given time among phenomena by means of controlled observation, but without attempting to control or modify the phenomena themselves. When using the descriptive method, the researcher engages in meticulous observation of phenomena for the purpose of gathering information or data. He then subjects these data to such counting, classification, and analysis as will allow for summarization or interpretation adequate for the purpose of the study. For example, a case or field study relying on firsthand observations, interviews, a survey, descriptive-type questionnaire or even recording instruments would be an example of the descriptive method.

### The Historical Method

In the historical method, events of the past are arranged in a logical and coherent manner to reveal hitherto unrealized relationships. Usually, personal and official records and correspondence and published material are examined and the extracted information or data are analyzed. Historical research involves more than the mere reporting of historical events. There is a requirement to interpret and evaluate. The historical researcher assumes a clear responsibility not only to seek out but also to evaluate critically the reports of observers of past events in order to describe accurately what happened and to clarify the relationships among those events.

### The Experimental Method

More than any other type of research, that using the experimental method is verifiable and leads to the most accurate prediction. A most important characteristic of the method is the "controlled situation." At the risk of oversimplification, if an effort is made to control and observe the phenomenon and its environment, the research is experimental. The experimental method then undertakes to find predictable relationships among variables by means of observation of phenomena in controlled environments.

Design Oriented Method

The design oriented study usually focuses on a particular problem or situation. It is frequently characterized by a research design which is based on analyses using various types of evaluative models. While this is probably the most difficult study to design considering validity and reliability, it can be the most rewarding and useful to the military profession.

## Section IV. THE RESEARCH PROPOSAL

Doing research is a reality long before any clear image of a research problem is perceived. Out of each person's background of education and accumulated knowledge or experience emerge conceptions and attitudes that prompt him to move intuitively toward what is unknown or toward a new truth or realization. The compulsion to learn what no other has known begins to be gratified when a problem to be investigated is identified, clearly stated, and placed in perspective. By this stage, research is well underway.

Formulating and stating the research problem is important. The beginning researcher usually underestimates the complexity of the task and the time required to accomplish it. If the problem is carefully and accurately stated, it will provide the guidelines for the research. When the research proposal is properly prepared the researcher knows:

First, where to start his research.

Second, how to proceed with the research.

Third, when the research is complete.

Every proposal will be reviewed for appropriateness in accordance with the requirements of the research option selected by the student officer. Proposals are to be submitted in the form shown in appendix A.

The topic selected by the student should be a viable one which meets the following standards: It should be of interest to the student; it should be significant and make an original contribution of knowledge to the field of military art and science; it should be researchable; and it should be acceptable to the Director, MMAS, and to his research committee.

## Section V. THE RESEARCH PROCESS

The procedures used to accomplish research are many. Regardless of the details of how research may be accomplished there is a commonality

recognizable in the efforts of all investigators. A list of the elements in the research process might be as follows:

1. Statement of the problem.
2. Review of the literature.
3. Development of the thesis, hypothesis, or research question.
4. Selection of methods and techniques - the research design (plan).
5. Collection of data.
6. Analysis and interpretation of data.
7. Development of conclusions.
8. Implications for application and further research.
9. Reporting results.

NOTE: Students working through these various phases should receive periodic clearances and approvals from their research advisors.

If all elements are accomplished, the research can be said to be complete (fig 2-1).

By the time the research proposal is approved some attention will have been paid to each of the above elements. The next step is to go as far into the subject as to be complete and concise. The following treatments of the elements of the research process are meant as guidelines to help save time and to improve efficiency.

## Statement of the Problem

A preliminary statement of the problem was accomplished in the research proposal. As the work progresses, refinements of the statement of the problem or a new problem may become necessary. The candidate who thinks he must abide with a problem statement that is not researchable is destined for an unnecessary failure and waste of valuable time.

## Review of the Literature

The scholar soon learns that the literature is an inexhaustible challenge. It is inappropriate to attempt to record every thought, fact, or concept that seems to bear on the topic. Extensive reading, however, is required. As one reads, the sources with the most value will become apparent. Focusing by expanding or narrowing the topic as early as possible will facilitate the best use of the researchers available time.

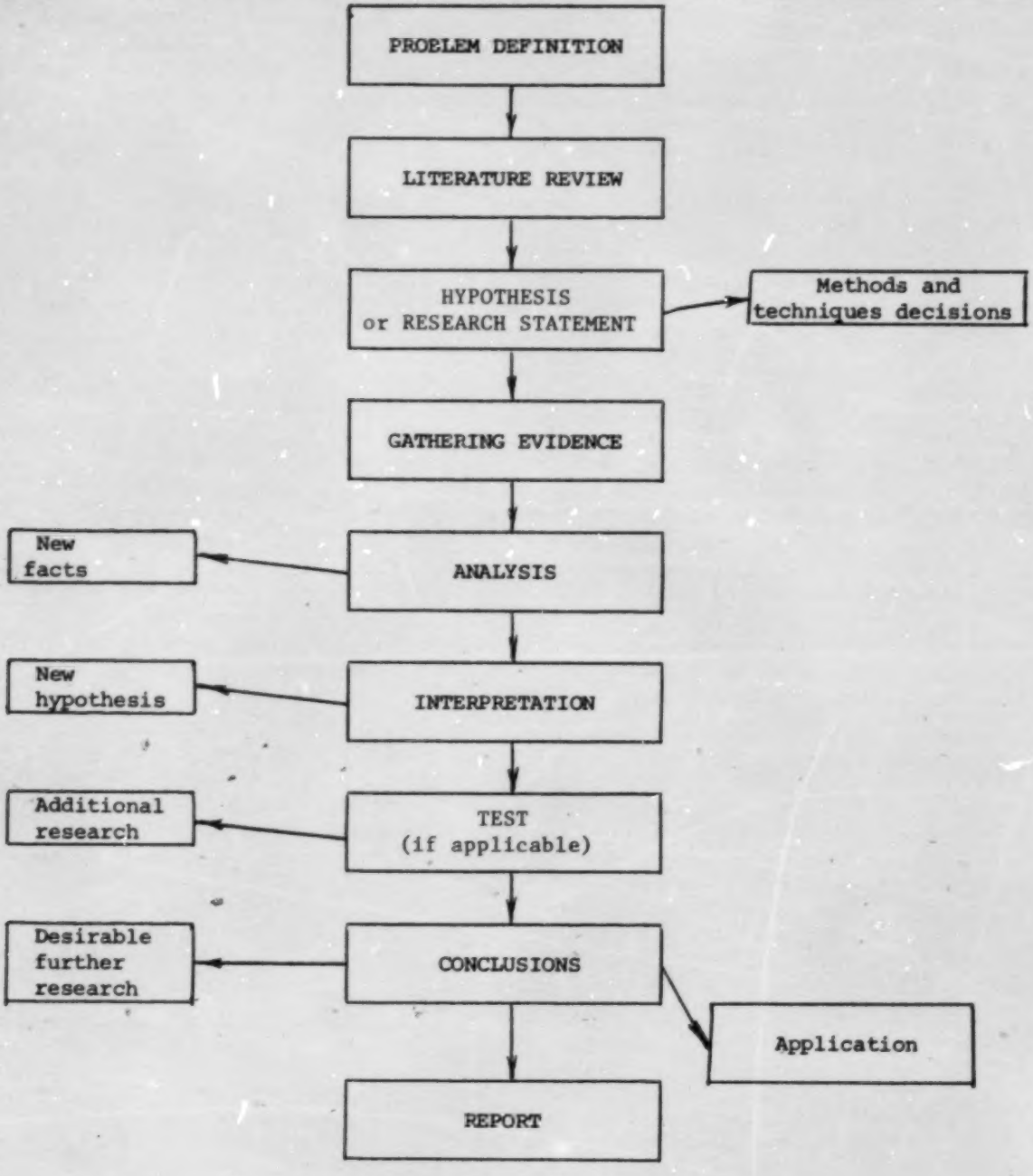


Figure 2—1. The research process (complete research).

Purpose. The purpose of the review of literature is to give the researcher a basic understanding of the problem area which he is studying. It would be difficult to overemphasize the importance of the literature survey. An early and adequate review of literature facilitates timely adjustments to the direction of the research and significantly enhances the probability of successfully completing the thesis.

The review of the literature should be complete and clear, but not excessively detailed. It should be worth reporting. In addition, if the ideas or data of other workers are used in the body of your own presentation, you must acknowledge the source and the author(s). Plagiarism is beneath the dignity of a scholar, a violation of professional ethics, and cause for punitive punishment as well as dismissal from the College.

Various indexes, bibliographies, abstracts, etc., should be used to locate titles of published works that are germane to your topic. From these various sources an extensive bibliography should be prepared. The bibliography has two basic purposes: To document the research product, and to enable the reader to look further into the field that is discussed. The bibliography should survey the depth and breadth of the subject under consideration, and reliance should not be placed on single sources. If part or all of any publication is read, dignify the effort with good bibliographic technique and make a complete record. A researcher cannot rely on his memory to keep everything sorted and accurate. All serious researchers devise a system suited to their own tastes. Most persons use file cards. Adopting a standardized way to make the record, early in your research, will save many hours of effort at a later time.

Notetaking. The student should be careful to get complete information on each bibliographical entry while he has that book, periodical, or document in hand. No one can depend on memory alone to retain and recall the facts obtained from reading. Every fact of importance should be accurately identified on a note card or in a journal notebook. As a suggestion, each idea should be recorded on a separate card or page and note the subject in the upper left corner on each card. Then the information can be sorted to fit the proper headings. In the upper right corner, place the number that will identify the source. At the end of the quotation or statement, give the page where it is located. All the facts should be dutifully recorded on a note card as a matter of habit. Information which is unrecorded may result in a significant loss of valuable time.

When taking notes, the student should form the habit of summarizing in his own words the facts or ideas set forth by the author, but he should be careful not to use the author's phrasing and sentence structure. He must be equally careful not to misrepresent the author's views nor to attribute to him ideas he did not express. If the student includes some of his own ideas in the notes on a specific book or document, he should be sure to indicate that they are his by putting them in brackets or by using some other device. A particularly apt quotation can be placed on the card, but should be clearly indicated by quotation marks and the page number.

As a minimum, a card referencing an article should contain, in order and uniformly located, the author(s), the year published, the complete title of the article, the journal, the volume, and the first and last pages. Two illustrations are given below:

Harry, Audley C. 1970

Youth and revolutionary development. Mil. Rev. 50 (5)*: 25-32

*The issue number is necessary when pagination begins anew in each issue.

Bellmore, M., H.J. Greenberg and J.J. Davis 1970

Generalized penalty-function concepts in mathematical optimization. Operations Res. 18: 229-254

References to books are made in a variety of ways. If footnotes are used in the text of your writing, a general reference to a book will suffice in the bibliography. If a single reference to a book is made in your text, the most pertinent pages for the reader should be specified. Two examples follow:

Plamenatz, John 1965

German Marxism and Russian Communism. Harper and Row, Publishers, New York, New York, xxiii, 356 pages.

Clark, James V. 1965

Motivation in work groups: A tentative view. pp. 451-468, In Lawrence, Paul R. and John A. Seiler (Eds.) Organizational Behavior and Administration, Rev. Ed., Richard D. Irwin, Inc. and the Dorsey Press, Homewood, Illinois, xiv, 981 pages.

An extensive bibliography in a thesis is impressive only if each reference contributes directly to the presentation. Comments concerning the work of other authors should be appropriate; i.e., either in support of or against your own presentation. Misrepresentation of another person's views, however, is not acceptable in research.

## Hypothesis-Research Question

Generally, a tentative solution to the problem is stated in the form of an hypothesis, or hypotheses, to be tested and either validated or refuted

by the results of the research data and information which has been produced. A research question is used in lieu of a hypothesis more commonly when data are not tested or as the research base for explanation in historical synthesis.

The statement of the general problem usually will be broad and set the stage for the research. The subproblem statements are more precise and facilitate direction for evaluation and/or interpretation of the research data.

The hypothesis is a distinguishing characteristic of traditional research. The term "hypothesis" may be applied in several different ways in research. It may be used to denote the preliminary "educated guess" based on intuition and past experience. In this context, the hypothesis will necessarily be stated in rather broad terms. Or, it may denote a theory developed after an extensive review and analysis of related literature and data about the problem and consideration and exclusion of other possible hypotheses. Such a hypothesis is generally called the "working hypothesis." Still another use of the term occurs when the working hypothesis has been tested and analyzed in light of relevant data and logical criteria. If verified, the hypothesis may then become "new knowledge," "theory," or "conclusions."

The tests of a good hypothesis are:

1. Does it explain all the data (or, at least, more than other hypotheses)?

2. Does it explain the data more simply than do other theories?

3. Is it so accurate that predictions based upon it will come true?

4. Does it suggest new and fruitful areas for further research?

The tests of a good thesis based on a research question are:

1. Is it unbiased?

2. Are findings reliable and valid?

3. Is it complete and concise?

4. Is it objective and believable?

5. Are conclusions substantiated by the data?

6. Is it based on an inquiry that is rigorous and systematic?

7. Is is based on the best available tools and data?

## Selection of Methods and Techniques

As the nature and scope of a research project forms in the mind of the investigator, he determines the major method or combination of methods to be used in the research. Similarly, the techniques and procedures to be used to gather data or information emerge. It is at this stage of research that the research advisor, library personnel, and other available experts should be utilized to the fullest extent possible. Many hours will be saved if an investigator draws upon the experiences and skills of these persons when drawing up his work plans. The uniqueness of a research finding may be bound to the inventiveness of the worker as he gathers and sorts his information and data.

A research technique is a means used to gather or analyze research data. A questionnaire is a technique. Other examples are the use of primary sources such as the division G2 journal or daily strength reports of units in combat. Research procedures are what a researcher does while employing his technique. Selecting and summarizing data are procedures. Preparing a table or graph is a normal procedure.

Notice that the researcher decides on his techniques for analyzing data before he gathers the data. This is very important, as it insures that an adequate amount of appropriate data are gathered, and that the researcher does not spend time or money gathering data that have no bearing (or only marginal bearing) on the problem being tested.

## Collection of Data

Research cannot proceed without data, whether they be statistical, documentary, or empirical. They are the base from which the investigator must reason and upon which he must rest his case. Serious research is not concerned with the random collection of odds and ends of information, but with the systematic assembly and analysis of all available evidence bearing on a problem. The more clearly a problem and hypothesis are stated, the surer will be the search for evidence relating to it.

Data come in many guises. The most familiar (and most comfortable) data can be converted into numbers and assembled into tables and treated statistically, or converted into some kind of graph or chart. Less familiar are data that require word descriptions to be recorded as phenomena. Visual summarizations of these are always difficult and sometimes impossible. The interpretive skill of the observer is most important in such research. In a similar way, the records of past events require skill in describing, sorting, and sequencing them before they become usable data. Regardless of the kind of data to be gathered, the skill of the investigator to marshal his facts is central to good research.

Data: primary and secondary sources. Scholarly investigations require accurate and complete information. Secondhand information can be very inexact or incomplete; verification of accuracy and completeness is difficult or impossible by reference to such sources. Therefore, the use of primary source materials is the most desirable in research activity.

A primary source relates firsthand knowledge or experience of an event or fact. It relates an event or fact as seen directly by an observer. An observer's viewpoint is not compromised or interpreted by a third party. A secondary source, on the other hand, is written or recorded about an event or fact. For example, Edward Gibbon's The Decline and Fall of the Roman Empire is a secondary source for that historical development. It is, however, a primary source for the development of historiography in 18th-century literature or philosophy. Albert Einstein's interpretation of the Michelson-Morley experiment is a secondary source for a description of the experiment itself, but a primary source for a study of Einstein's thought. (See Hillway, pp. 88-90, for an expanded discussion.)

Reporting the data. The presentation of data may take any of several forms. In many types of studies they are presented in narrative form--that is, word descriptions. In some studies data will be presented in tables, charts, and graphs. Whatever the form chosen, whether in words, charts or graphs, an investigator must try to make it most effective and useful to the potential reader. The presentation of data, especially if it is in graphs or tabular form, should not break up the narrative into discontinuous segments. If a graph or table, including any explanation, requires more than one-third of a typewritten page, devote an entire page to it. A few tables and/or graphs can be interspersed in the text with advantage. Large numbers of charts, tables, maps, etc., are better placed in an appendix. One technique used is to summarize briefly the key contents of a table or graph in the narrative and insert the instruction "(See appendix ))."

## Analysis and Interpretation of Data

Quite often, in research, far more information is gathered than can be used in presenting a solution to the problem being studied. It is at this time that evaluation of the data begins, the first step is to eliminate superfluous information from further consideration. It is at this juncture in research that the test of a true scholar begins. The "pick and shovel" work is past and the researcher is confronted with the mass of data that he, in one sense, created. No research advisor, librarian, expert or friend should perform this task for the researcher. The sorting, selecting, and reasoning is his sole responsibility (and privilege). It should be understood that the student does not necessarily have to establish causal relationships between conditions. He can observe appropriately that condition A and condition B exist, but it is not necessarily his burden to prove that one causes the other. Also the fact that no causal relationship exists between two conditions can be an important research finding.

Almost certainly, as the data are being collected, ideas, attitudes, and even prejudices are being formed about the problem under investigation. Now, an unbiased analysis is demanded so that the work can survive peer group criticism and be regarded as a significant addition to the subject studied. The author's findings when presented, however, should be validated by the research evidence.

Evaluation of data is an indispensable step in the research process. Statistical and nonstatistical procedures are used. Statistical analyses are justified when the data are genuinely numerical and extensive enough to promise more than is obvious from mere inspection. Correlations, regression analyses, and computerized multivariate statistical programs often assist a researcher to discover inferences, to form reliable generalizations, and to test the validity of his hypotheses. A word of caution is necessary. Statistical analyses do not convert poor or inaccurate data into good information. Stated in another way, mathematical manipulation of numbers does not justify poor data. Badly used, statistics can misrepresent the data and mislead the reader. Skillfully used, statistics greatly strengthen the presentation of a researcher's views.

Nonstatistical procedures require inductive and deductive reasoning from primarily nonquantitative data. Such data require careful arrangement and logical handling. The findings of the researcher will stand the tests of criticisms only if his presentation precludes errors of both omission and commission.

Once the job of sorting and analyzing the data and reasoning from it is completed, a series of questions should be asked:

1. Are all the necessary data gathered?

2. Are all the necessary data reported?

3. Are all the unnecessary data eliminated?

4. Are the data presented in appropriate ways? (Tables, graphs, figures, etc., can save thousands of words.)

5. Is the presentation clear, using the minimum number of words?

6. Does the presentation solve the problem, prove the proposed hypothesis, or answer the research question?

7. Is this a significant contribution to the subject studied?

## Development of Conclusions

In the research process, if everything preceding this stage has been done, statements can now be framed that propose new insights into the stated purpose of the research, or provide answers to the questions embodied in the stated problem, or prove or disprove the stated hypothesis. The conclusions reached must be inferred directly from the data and within the limitations imposed by the design of the study.

## Implications for Application and Further Research

Implications are based upon the data, but are not necessarily confined within the limitations imposed by the design of the study. Practical applications that may be derived from the work are appropriate inferrences for the researcher to make. So, too, are suggestions concerning additional research in the subject. In military art and science the inferences derived from a piece of research may be even more important than the conclusions reached by the study itself.

## Five Most Common Research Difficulties

1. The problem must be carefully defined as the first and most important step of research. Time and effort poorly invested in problem definition results in a potential pyramid of difficulty.

2. Adequate research must be accomplished to develop significant results. Less than complete research results in a questionable product of minimum value.

3. Positions of advocacy should be avoided. A thesis should not be written to prove a point, but rather to conduct research to discover truth.

4. Grammar, spelling, and style should be polished in the early drafts. This is the responsibility of the student, not the research committee.

5. When there are complex uses of statistics and mathematical models, authorities with expertise in these fields should be consulted early in the process before conducting and gathering research data. If applicable, the design of the research must be based on consideration of the requirements of statistical tests or the mathmatical model. Assistance in this regard may be requested from designated staff and faculty members.

## Publication of Research

Theses will be reproduced and distributed routinely based on the recommendations of the candidate and the research advisor. Complete addresses, including file symbol, office title, or name of the interested party are required. Many theses will be entered into the Defense Documentation Center to make them widely available to Department of Defense personnel.

Effective communication is the primary requirement in all writing. Directness is appreciated unless the effort to economize on words leads to omissions or misconceptions. Individual writing styles are encouraged as long as good usage and good taste prevail. Each thesis should have the following:

1. Title page (app B).
2. Theses approval page (app C).
3. Abstract.
4. Acknowledgments (if any).
5. Introduction, including a Statement of the Problem.
6. Review of the literature.
7. Materials and methods.
8. The data.
9. Discussion.
10. Suggestions of further research.
11. Summary and conclusions.
12. Appendix.
13. Bibliography.

The above list is an outline to aid a writer in considering the needs of his thesis. It is not all inclusive.

The Defense Documentation Center documents at appendix D must be completed and submitted with the final copy of this thesis.

## Title Page

A sample title page is given at appendix B. It may be appropriately modified to fit the particular kind of research writing being done.

## Abstract

An abstract consists of a short statement of the problem; a brief exposition of the methods and procedures employed in gathering the data; and a condensed summary of the findings of the study. The abstract should tell a reader what problem was studied, what was done by the researcher, and what was discovered, found out, determined, or proved. The CGSC thesis abstract should not exceed 300 words.

In composing an abstract, keep the following in mind.

1. A good abstract has information, a condensation or summary of the research results, not merely a description of its contents. The "descriptive" error is most frequently revealed in such phrases as "Chapter 4 begins with a discussion of...." The abstract reader is not concerned with a mere list of the subjects discussed, nor in what particular chapter. He wants the important ideas, facts, analyses, and conclusions.

2. Exposition of research methods and procedures should be brief and to the point. It is not necessary to make extensive lists of subjects, nor to tell the reader the report contains "analyses, descriptions, and conclusions." The reader wants the substance of the subjects, analyses, and conclusions--and he should get these in concise summary form.

3. Abstracts are written for the convenience of the reader. The abstract should reveal the major points of the work in concise language without requiring the reader to study the thesis itself. He can obtain a copy for more detailed study, knowing that it contains information useful to him; or he can, with confidence, refrain from obtaining a copy with assurance that the abstract is in fact an accurate summary. The author should carefully select his title and word his abstract to facilitate accurate computer storage and reference listings for retrieval.

The abstract and the title should be unclassified. However, if the abstract is necessarily classified, a short, unclassified description of the thesis will be submitted for dissemination in the College abstract booklet.

Style

1. The researcher should write his thesis in a simple, direct style, avoiding pompous language, involved sentences, and other circumlocutions. Language should be scholarly, precise, and grammatically correct, but without affectation.

2. Proper "word use" is important. Examples of misuse are limit and caveat to mean an indicator. Caveat is a warning or caution rather than merely an indicator. The meaning of words should be checked in a good dictionary and thesaurus if there is doubt as to the exact meaning.

3. It is important to be judicious in the use of quoted materials since most ideas should be stated in the words of the author. Short quotations may be woven into the text very effectively with such devices as "one economist puts it this way," or "this observer reports."

4. The use of abbreviations should be avoided. If, for good reasons, the author feels that he must use an abbreviation, he should write it out in full the first time it is used; e.g., North Atlantic Treaty Organization (NATO). The words United States and United Nations should not be abbreviated in the text, except as adjective modifiers; i.e., US Armed Forces, UN Forces.

5. Avoid the use of slang and faddish words.

6. Do not use contractions, such as isn't and can't.

7. Except in tables, underline titles of works of art, names of ships and boats, names of docks, and names of aircraft.

8. The first reference to an individual should include his full name and, if he is not well known, some identification.

9. For specific help, consult Form and Style in Thesis Writing, 3d edition, by William G. Campbell, 1969 or 4th edition, 1974.

10. Plagiarism, or use of the material and ideas of others without proper recognition of the source, must be carefully avoided. From an operational point of view, the two following requirements apply:

a. If three or more words in sequence are used from another source, they must be placed in quotation marks and cited in a footnote.

b. If a general idea or thought is derived from another source but is paraphrased in such a way that there are not three words in sequence from the original source, the source must be cited in a footnote; but the material would not be placed in quotation marks, since it is not a direct quote.

## Acknowledgments

This heading is used when it is appropriate to identify and express appreciation to individuals or organizations who have contributed substantially, either in terms of information or ideas, to the development of the thesis. It is not necessary to acknowledge the assistance of the research advisor however excellent and helpful this may have been. It is appropriate, however, to identify individuals as the source of important data or ideas in a given field that were of material assistance to the author in his development of the thesis. If a preface or foreword (the meaning is the same) is used, any necessary acknowledgments may be included.

## Administrative Absence for Conduct of MMAS Research

On occasion the research is of sufficient value and of a nature that the student must be absent from the College. Following is the procedure for handling administrative absence.

1. Each request for administrative absence will be initiated on a disposition form (DF) by the MMAS candidate stating in full his plan and his contacts. In the request he will state that he has made arrangements to make up any class work he will miss.

2. The request will be reviewed by the research advisor and, if approved, submitted through the Director, MMAS, to the Class Director.

3. If approved by the Director, MMAS, the request will be forwarded to the Class Director for approval and orders.

4. Administrative absence orders will carry the stipulation that no expense to the Government is involved.

## APPENDIX A

## PROPOSED THESIS PROBLEM STATEMENT

1. Submitted by: (name, rank, branch, section)

2. To: Director, Master of Military Art and Science

3. Proposed Thesis Problem Statement. Write a clear, concise description of the nature and scope of the problem you will examine. It can be presented in any of several ways:

a. The purpose statement. Describe what is presently known about the problem, the current approach to solving it, and describe the purpose of the research effort in obtaining a solution to the problem.

b. The question form. State the problem as a question, or series of questions, to be answered by the research.

c. The hypothesis form. Describe the problem, then state a proposed solution in the form of a hypothesis to be tested in the research program.

d. The following questions will help you evaluate the usefulness of your problem statement.

(1) Does the statement introduce a problem or merely a topic?

(2) Is it feasible in terms of resources and facilities?

(3) Is it significant to the field of study?

(4) Is the scope appropriate to the time available for the study?

(5) Are subordinate problems or issues identified?

(6) Is the problem stated without bias?

4. Background to the problem. Place the problem in perspective, to include:

a. The importance of the problem and its solution.

b. Relevance to the discipline of military art and science.

c. Definition of special or technical terms, if appropriate.

5. Research methods, techniques, necessary assumptions, and tentative hypotheses.

6. Annotated bibliography of available research sources. Use the bibliographic format shown in a style manual to list the articles, books, primary sources and other publications that you intend to consult.

_____

signature

## APPENDIX B

## SAMPLE TITLE PAGE

---

(1 1/2 inches from top of page)

BREACHING WALLS IN URBAN WARFARE

(3 inches from top of page)

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE

(5 1/4 inches from top of page)

by

A. E. HARTLE, MAJ, USA
B.S., United States Military Academy, 1964
M.A., Duke University, 1971

(7 3/4 inches from top of page)

Fort Leavenworth, Kansas
1977

## APPENDIX C

## SAMPLE THESIS APPROVAL PAGE

---

### MASTER OF MILITARY ART AND SCIENCE

### THESIS APPROVAL PAGE

Name of candidate _____

Title of thesis (Use as many lines as required for title) _____

_____

Approved by:

_____, Research Advisor

_____, Member, Graduate Faculty

_____, Member, Consulting Faculty

Accepted this _____ day of _____ 1977 by _____,
Director, Master of Military Art and Science.

The opinions and conclusions expressed herein are those of the individual student author and do not necessarily represent the views of either the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

# APPENDIX D

# DEFENSE DOCUMENTATION CENTER DOCUMENTS

## INSTRUCTIONS FOR PREPARATION OF REPORT DOCUMENTATION PAGE

RESPONSIBILITY. The controlling DoD office will be responsible for completion of the Report Documentation Page, DD Form 1473, in all technical reports prepared by or for DoD organizations.

CLASSIFICATION. Since this Report Documentation Page, DD Form 1473, is used in preparing announcements, bibliographies, and data banks, it should be unclassified if possible. If a classification is required, identify the classified items on the page by the appropriate symbol.

### COMPLETION GUIDE

General. Make Blocks 1, 4, 5, 6, 7, 11, 13, 15, and 16 agree with the corresponding information on the report cover. Leave Blocks 2 and 3 blank.

Block 1. Report Number. Enter the unique alphanumeric report number shown on the cover.

Block 2. Government Accession No. Leave Blank. This space is for use by the Defense Documentation Center.

Block 3. Recipient's Catalog Number. Leave blank. This space is for the use of the report recipient to assist in future retrieval of the document.

Block 4. Title and Subtitle. Enter the title in all capital letters exactly as it appears on the publication. Titles should be unclassified whenever possible. Write out the English equivalent for Greek letters and mathematical symbols in the title *(see "Abstracting Scientific and Technical Reports of Defense-sponsored RDT/E," AD-667 000)*. If the report has a subtitle, this subtitle should follow the main title, be separated by a comma or semicolon if appropriate, and be initially capitalized. If a publication has a title in a foreign language, translate the title into English and follow the English translation with the title in the original language. Make every effort to simplify the title before publication.

Block 5. Type of Report and Period Covered. Indicate here whether report is interim, final, etc., and, if applicable, inclusive dates of period covered, such as the life of a contract covered in a final contractor report.

Block 6. Performing Organization Report Number. Only numbers other than the official report number shown in Block 1, such as series numbers for in-house reports or a contractor/grantee number assigned by him, will be placed in this space. If no such numbers are used, leave this space blank.

Block 7. Author(s). Include corresponding information from the report cover. Give the name(s) of the author(s) in conventional order *(for example, John R. Doe or, if author prefers, J. Robert Doe)*. In addition, list the affiliation of an author if it differs from that of the performing organization.

Block 8. Contract or Grant Number(s). For a contractor or grantee report, enter the complete contract or grant number(s) under which the work reported was accomplished. Leave blank in in-house reports.

Block 9. Performing Organization Name and Address. For in-house reports enter the name and address, including office symbol, of the performing activity. For contractor or grantee reports enter the name and address of the contractor or grantee who prepared the report and identify the appropriate corporate division, school, laboratory, etc., of the author. List city, state, and ZIP Code

Block 10. Program Element, Project, Task Area, and Work Unit Numbers. Enter here the number code from the applicable Department of Defense form, such as the DD Form 1498, "Research and Technology Work Unit Summary" or the DD Form 1634, "Research and Development Planning Summary," which identifies the program element, project, task area, and work unit or equivalent under which the work was authorized.

Block 11. Controlling Office Name and Address. Enter the full, official name and address, including office symbol, of the controlling office. *(Equates to funding/sponsoring agency. For definition see DoD Directive 5200.20, "Distribution Statements on Technical Documents.")*

Block 12. Report Date. Enter here the day, month, and year or month and year as shown on the cover.

Block 13. Number of Pages. Enter the total number of pages.

Block 14. Monitoring Agency Name and Address *(if different from Controlling Office)*. For use when the controlling or funding office does not directly administer a project, contract, or grant, but delegates the administrative responsibility to another organization.

Blocks 15 & 15a. Security Classification of the Report: Declassification/Downgrading Schedule of the Report. Enter in 15 the highest classification of the report. If appropriate, enter in 15a the declassification/downgrading schedule of the report, using the abbreviations for declassification/downgrading schedules listed in paragraph 4-207 of DoD 5200.1-R.

Block 16. Distribution Statement of the Report. Insert here the applicable distribution statement of the report from DoD Directive 5200.20, "Distribution Statements on Technical Documents."

Block 17. Distribution Statement *(of the abstract entered in Block 20, if different from the distribution statement of the report)*. Insert here the applicable distribution statement of the abstract from DoD Directive 5200.20, "Distribution Statements on Technical Documents."

Block 18. Supplementary Notes. Enter information not included elsewhere but useful, such as: Prepared in cooperation with . . . Translation of *(or by)* . . . Presented at conference of . . . To be published in . . .

Block 19. Key Words. Select terms or short phrases that identify the principal subjects covered in the report, and are sufficiently specific and precise to be used as index entries for cataloging, conforming to standard terminology. The DoD "Thesaurus of Engineering and Scientific Terms" *(TEST)*, AD-672 000, can be helpful.

Block 20. Abstract. The abstract should be a brief *(not to exceed 200 words)* factual summary of the most significant information contained in the report. If possible, the abstract of a classified report should be unclassified and the abstract to an unclassified report should consist of publicly- releasable information. If the report contains a significant bibliography or literature survey, mention it here. For information on preparing abstracts see "Abstracting Scientific and Technical Reports of Defense-Sponsored RDT&E," AD-667 000.

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

| REPORT DOCUMENTATION PAGE | | READ INSTRUCTIONS BEFORE COMPLETING FORM |
|---|---|---|
| 1. REPORT NUMBER | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER |
| 4. TITLE (and Subtitle)<br>Breaching Walls in Urban Warfare | | 5. TYPE OF REPORT & PERIOD COVERED<br>Final Report 11 Jun 76<br>6. PERFORMING ORG. REPORT NUMBER |
| 7. AUTHOR(s)<br>Hartle, Anthony E., MAJ, USA | | 8. CONTRACT OR GRANT NUMBER(s) |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>Student at the U.S. Army Command and General Staff College, Fort Leavenworth, Kansas 66027 | | 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS |
| 11. CONTROLLING OFFICE NAME AND ADDRESS<br>US Army Command and General Staff College<br>ATTN: ATSW-SE | | 12. REPORT DATE<br>11 Jun 76<br>13. NUMBER OF PAGES<br>87 |
| 14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office) | | 15. SECURITY CLASS. (of this report)<br>(Classified)<br>Unclassified<br>15a. DECLASSIFICATION/DOWNGRADING SCHEDULE |

16. DISTRIBUTION STATEMENT (of this Report)

Distribution limited to U.S. Government agencies only: Proprietary Information Other requests for this document must be referred to U.S. Army Command and General Staff College, Fort Leavenworth, Kansas 66027 (For classified theses)

Approved for public release; distribution unlimited. (For unclassified theses)

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

Approved for public release; distribution unlimited.

18. SUPPLEMENTARY NOTES

Master of Military Art and Science (MMAS) Thesis prepared at CGSC in partial fulfillment of the Masters Program requirements, U.S. Army Command and General Staff College, Fort Leavenworth, Kansas 66027

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

See reverse.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

This study attempts to determine if there is a need for a wall-breaching capability in infantry units today. The investigation is focused on an analysis of historical experience, contemporary urban areas, and the capabilities of U.S. Army weapons.

Investigation reveals that a distinct need for a wall-breaching capability in infantry units does exist, and that current weapons and equipment readily available to the infantry rifle company are inadequate for this purpose. Further examination reveals that the means of satisfying the requirement are within the capability of current technology.

(Not to exceed 200 words)

DDC COVER SHEET

(11 spaces down from top of paper)
Breaching Walls in Urban Warfare

(15 spaces down from top of paper)
Anthony E. Hartle, MAJ, USA
U.S. Army Command and General Staff College
Fort Leavenworth, Kansas 66027

(26 spaces down from top of paper)
Final report 11 June 1976

(36 spaces down from top of paper)
(Classified) Distribution limited to U.S. Government agencies only; proprietary information. Other requests for this document must be referred to U.S. Army Command and General Staff College, ATTN: ATSW-SE, Fort Leavenworth, Kansas 66027.

(48 spaces down from top of paper)
A Master of Military Art and Science thesis presented to the faculty of the U.S. Army Command and General Staff College, Fort Leavenworth, Kansas 66027

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| AD B006697L | | | |

**1. REPORT IDENTIFYING INFORMATION**

A. ORIGINATING AGENCY
US Army Command & General Staff College

B. REPORT TITLE AND/OR NUMBER
Assured Air Line of Communications: A Light Corps in a Middle East Setting

C. MONITOR REPORT NUMBER
Final Report—6 June 1975

D. PREPARED UNDER CONTRACT NUMBER(S)
N/A

**2. DISTRIBUTION STATEMENT**
Distribution limited to U.S. Government agencies only; Proprietary Information; 6 June 1975.*

DDC FORM FEB 75 50 — PREVIOUS EDITION MAY BE USED UNTIL SUPPLY IS EXHAUSTED

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**REQUESTER:**
1. *Put your mailing address on reverse of form.*
2. *Complete items 1 and 2.*
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DDC FORM 50

# APPENDIX E

## PROOFREADING HELPS

Proofreader marks should be made in margin with a line drawn from margin to actual point of error. All proof marks and comments should be written horizontally in the margin, never parallel to edges of page. Author must use *hard red pencil* (never grease pencil); blue is reserved for use of Editing and Publishing Unit. Author must initial correct proof pages in upper right-hand corner and place an "X" on incorrect pages. (Para 9, IC 3)

### Proofreader's Marks

| | |
|---|---|
| ^ | Caret—insert (used to insert punctuation, superior figures, etc.) |
| # | Insert space |
| ⁀ | Close up or join |
| ⌒ | Delete—take out |
| Stet | Let it stand |
| ∽ | Words or letters change places |
| Ⓠ | Query to author—Is this correct? |
| l.c. or lc | Change to lowercase letters |
| —— | Underline letters to be changed to italic |
| ≡ | Underline letters to be changed to capitals |
| ~~~ | Underline letters to be changed to boldface |
| ++++++ | Letters or words to be underlined |
| ¶ | Paragraph here |
| No ¶ | No paragraph here |
| (/) | Parentheses |
| wf | Wrong font (type of improper size or style) example: Improper |
| ⊏ | Move to left |
| ⊐ | Move to right |
| ⊗ | Bad or broken letter |
| Rom | Roman—as opposed to italic |

Do not edit proofs. Make editorial changes on original copy before type is set. Changes on proofs usually result in expensive resetting of type. Read and mark your proofs carefully and second proofs will not be necessary.

# APPENDIX F

## TYPING AIDS[1]

1. Margins: (p. 111)[2] It is important that all information on the page, including the page number, be placed in an area 6 3/4" x 9 1/2" of an 8 1/2 x 11-inch page. The following margins apply:

Left Margin is 1 1/2 inches or 18 spaces from left paper edge.
Right margin is 1 inch or 12 spaces from right paper edge.
Top margin is 3/4 inch or four lines down from top edge of paper.
Bottom margin is 1 inch or six lines up from bottom edge of paper.

2. Indentions: (pp. 107 and 112)

Enumerations--first enumeration is indented eight spaces from left margin with succeeding enumerations indented four spaces from previous indentation.
Paragraphs are eight spaces from margin or 26 spaces from left paper edge.
Quotations over three lines are set in four spaces (or 22 spaces from left paper edge) from regular margin with an eight-space paragraph indention from regular margin. Quotations will be single spaced with double spacing between paragraphs (p. 14; e.g., p. 17).
Bibliography--first line at the margin, other lines indented four spaces from margin or 22 spaces from left paper edge.

3. There should be 72 spaces per line or 6 inches. Approximately 26 lines per page (plus or minus one). Nothing should be beyond the right margin; avoid too many hyphens by stopping two or three spaces beyond bell. Page number is located four lines down and at the right margin. Text begins six lines down at the left margin (pp. 8 and 9).

4. Titles and Captions: (pp. 9-11)

Chapter--
Chapter number (centered and 10 lines from top paper edge).
CHAPTER 2
Triple space
Chapter title (all letters capitalized, inverted pyramid and double spaced between lines).
Triple space
Text
Free-standing sideheading--triple space before, double space after, underlined.
Paragraph sideheading--triple space before, double space after, underlined.

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[1]Spaces per inch are based on elite type.

[2]Page numbers are from Campbell, Form and Style in Thesis Writing, 1969 edition.

5. Footnotes: (pp. 23 and 24)

Footnote line is 18 spaces long and 2 lines down from text.

Footnote is indented eight spaces; no space or period between raised letter and body of footnote; allow 4 lines per footnote at the bottom of the page plus 4 lines for footnote line from end of text. These are in addition to the bottom margin.

Short footnotes may be placed on the same line if at least 3 spaces are allowed between footnotes and the complete footnote can be put on the line.

If used, the following abbreviations should be checked carefully:

Ibid. means in the same place; page number can change; must immediately follow the work it refers to. It is advisable not to use to refer to works in previous chapters.

Op. cit. means the same reference but a different page. It refers to some previous work not immediately preceding the footnote. Use the author's last name with it.

Loc. cit. means in place previously cited; the page number is the same. It also refers to some previous work not immediately preceding the footnote. Use the author's last name with it.

6. Thesis Order:

Title page
Approval page
Abstract page
Acknowledgments (if any)
Table of contents
List of tables (if any)
List of figures (if any)
Text or body of paper
Division sheet (APPENDIX centered on page, 30 lines down)
Appendix
Division sheet (BIBLIOGRAPHY centered on page, 30 lines down)
Bibliography (divided as below if more than 30 entries)
- Books
- Government documents
- Periodicals and articles
- Unpublished material
- Other sources

## APPENDIX G

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*This partially annotated bibliography is to aid the candidate in his preparation to conduct research. It is not an example for candidate requirements.

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